

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraphs beginning on page 3, line 17, with the following amended paragraphs:

$$\text{Velocity} = \frac{1}{\alpha} \left(V_M - Ri - L \frac{di}{dt} \right) V_M - Ri - L \frac{di}{dt} \quad (1)$$

Please replace the paragraph beginning on page 8, line 13, with the following amended paragraph:

As shown therein, an apparatus for controlling an operation of a reciprocating compressor according to the present invention includes a current detecting unit 80 for detecting a current applied to a compressor 30; a stroke detecting unit 60 for detecting a stroke generated at the compressor 30; a mechanical resonant frequency calculating unit 70 for calculating a mechanical resonant frequency (P_{avg}) with using a current outputted from the current detecting unit 80 and a stroke outputted from the stroke detecting unit 60; an operation frequency reference value determining unit 40 for determining an operation frequency reference value within a predetermined range ($0 \pm d$) of the calculated mechanical resonant frequency; a first comparator 10 for comparing the operation frequency reference value and a current (present) operation frequency, and outputting a difference value according to the comparison result; a second comparator 50 for comparing the stroke outputted from the stroke detecting unit 60 and a stroke reference value, and outputting a difference value according to the comparison result; and a controller 20 for varying an operation frequency of the compressor according to the difference value outputted from the first comparator 10, varying a voltage applied to the compressor according to the difference value outputted from the second comparator 50, and thus controlling a stroke.

Please replace the paragraph beginning on page 8, line 13, with the following amended paragraph:

First, the current detecting unit 80 detects a current applied to the compressor 30, and the stroke detecting unit 60 detects a stroke generated at the compressor 30. Herein, the compressor 30 means a reciprocating compressor, and preferably means a linear type reciprocating compressor. Also, the stroke is detected determined by calculating with a sensorless method (i.e., determined using voltage and current).

Please replace the paragraph beginning on page 8, line 18, with the following amended paragraph:

Thereafter, a mechanical resonant frequency (P_{avg}) is calculated, using the current outputted from the current detecting unit 80 and the stroke outputted from the stroke detecting unit 60. The mechanical resonant frequency (P_{avg}) is obtained by multiplying the current and the stroke, and then averaging the obtained value for one period (elapsed time when the piston reciprocates between the top point and the bottom point of the compressor). As shown in Figure 4, when the mechanical resonant frequency is close to zero, the compressor obtains maximum operation efficiency.

Please replace the paragraph beginning on page 11, line 3, with the following amended paragraph:

Figures 7a ~7d are graphs showing relations between a predetermine-predetermined range of a mechanical resonant frequency and a stroke/a current.